AGRICULTURAL RESEARCH IN CANADA

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The theme of this morning's session couldn't be more pertinent, or more timely. Resources devoted to agricultural research in Canada are under the gun, and this has serious, and potentially devastating implications for the future of our industry. While the industry has recognized the seriousness of this situation for some time, we have not been successful in convincing those in Ottawa who have the final say over government expenditures that resources for research should be a top government priority.

I've been invited to speak on Agricultural Research in Canada. You may have gathered already that I will not be addressing this topic without bias! In the time that I have this morning I am going to focus on the current status of our agricultural research establishment in the context of the role it plays in the overall development and well-being of our industry.

Simply put, we look to the research community for biological products and technologies which lower our costs, and which improve our work environment, productivity, certainty of production and the quality of the products produced. We adopt these technologies in order to remain competitive and stay in business. Thus the ability of the research community to provide us with these technologies to a large extent determines whether or not we can remain competitive.

To date, the performance of our research establishment has been outstanding. The question now is, does our research community have the resources needed to continue to fulfill these responsibilities?

This has been a major concern of the members of the Canada Grains Council for some time.

In April of 1983, the Council issued a report prepared by its Grain Production Committee entitled A Strategy for Expanding Grain Production in Western Canada. The Production Committee proposed a long-term development strategy for the grain industry comprised of five elements. The strategy was based upon the premise that world markets would soon become extremely competitive, and that we would not be able to compete in a subsidization war with the U.S. or the E.E.C. The cornerstone of the strategy proposed was a commitment to research excellence, and three of the five recommendations proposed by the Committee related to technology development and transfer.

The first recommendation of the Committee was that Agriculture Canada revitalize its Research Branch in western Canada. The Committee felt that a minimum of $20 million per year for five years would be needed to compensate for the erosion in research capabilities which had resulted from a decade of reduced funding through the 1970's.

Art Guitard, a familiar name to many here, was the chairman of the Production Committee. At that time Art was Director-General of the Research Branch for Western Canada. Other Saskatchewan representatives on the Committee included Les Henry from the University; Bill Copeland from Rosetown; and John Buchan from Saskatchewan Agriculture in Regina.

Developments since the release of the Committee's report have been as the Committee predicted. We moved from the buoyant market conditions of the early 1980's to the poor market conditions of the present. The outlook for improvement in these conditions is not promising, and we are not in a position to compete on the basis of subsidies with the U.S. and the E.E.C.

With respect to the Committee's recommendation concerning increased funds for research, some progress has been made, but overall the situation has deteriorated. The outlook, given the current fiscal situation in Ottawa, is foreboding.

At the Council's last annual meeting in April of 1985, a task force was struck to investigate the adequacy of Canada's agricultural research efforts. The task force prepared a report summarizing its findings, entitled Agricultural Research in Canada, which was released last October in Ottawa. Response to the report from those within the industry and the research establishment has been very positive.

Unfortunately, you and I don't control the purse strings in Ottawa. The task we face isn't to convince ourselves, or Agriculture Canada, of the importance of research. The task is to convince the public and the Federal government, and more particularly, the Finance Department and Treasury Board, of our case.

The Council's task force has built a case to take to Ottawa and the Canadian public based on five components:

1. That the agriculture and food industry makes an immense contribution to the health and well-being of Canadians and Canada's economy.

2. That the economic benefits which accrue from agricultural research are so attractive that funds devoted to research should be considered as an investment, rather than as an expense.

3. That due to almost 15 years of financial restraint in a highly inflationary period, the current level of Federal funding for research is not sufficient to maintain our competitiveness in world markets.

4. That even if we provide the financial resources needed, we face significant problems with respect to qualified manpower.

5. That a major review of the research planning and priority setting mechanisms is necessary to ensure that our research resources are allocated in the best manner possible.

Let me expand on these in more detail.

1. The Contribution Agriculture Makes to the Canadian Economy:

- Agriculture accounts for a consistent 9 - 10 percent of Canada's Gross Domestic Product (Table 1). In 1983, the last year for which we have data, this amounted to $35 billion in current dollars.

- Two-thirds of this is from activity beyond the farm gate - processing, transportation, storage, wholesaling, retailing, etc. (1983 - $25.5 billion).

- Between 1980 and 1984, export earnings from agricultural products averaged $9.1 billion per year.

- Over the last 5 years farm cash receipts averaged $18.5 billion per year.

- A study conducted by the Council in 1983 showed that the grains and oilseeds sector alone provided employment directly or indirectly for about 440,000 people.

Truly impressive.

The entreprenurial capabilities of our farmers, and past excellence in agricultural research, is largely responsible for this performance. It is often overlooked that Canada is not particularly well endowed with prime agricultural resources or a favourable

TABLE 1

GROSS DOMESTIC PRODUCT IN CONSTANT (1971) DOLLARS, CANADA, 1971-1983

Year	Primary Agriculture	Manufacture and Distribution of Food, Beverages and Tobacco Products Beyond the Farm Gate				Total Agriculture		Total Gross Domestic Product	Total Agriculture as Percent of Total GDP
		Processing (except food)	Transportation and Storage	Wholesaling	Retailing	Value Added	Combined		
				($ millions)					
1971	2695.7	2676.7	589.5	642.4	2555.9	6475.5	9171.2	83260.5	11.0
1972	2389.9	2834.4	620.5	695.4	2702.6	6852.6	9242.5	88143.1	10.5
1973	2612.0	2933.8	586.0	684.2	2824.9	7028.9	9640.9	95028.4	10.1
1974	2412.6	2908.5	570.2	676.0	2967.6	7122.3	9534.9	99347.2	9.6
1975	2776.1	2901.7	604.1	708.4	3068.7	7282.9	10059.0	100282.6	10.0
1976	2948.0	3076.6	616.9	739.6	3322.4	7755.5	10703.5	105415.6	10.2
1977	3067.2	3115.1	667.1	767.3	3389.0	7938.5	11005.7	108329.6	10.2
1978	2993.8	3130.9	656.5	809.0	3473.6	8070.0	11063.8	111879.3	9.9
1979	2702.8	3217.4	644.3	822.6	3479.6	8163.9	10866.7	116295.9	9.3
1980	2958.9	3217.2	691.3	856.8	3511.1	8276.4	11235.3	117779.7	9.5
1981	3189.4	3285.3	730.2	875.2	3525.3	8416.0	11065.4	121053.2	9.6
1982	3294.9	3253.6	754.1	901.2	3444.7	8353.6	11648.5	115888.5	10.1
1983	3248.3	3254.4	777.4	947.8	3443.6	8433.2	11681.5	119005.3	9.8

Source: G.Walford and P. Lys (Spring, 1985). "Value Added". Agrologist. P.11.

climate. We have few geographic advantages that might contribute to a competitive edge in world markets. In fact, most agricultural activities in this country are devoted to overcoming geographic and climatic barriers to agricultural development. It is our farm community, backed by an unsurpassed research and development capability, that has built the industry that we see today.

2. Agricultural Research as an Attractive Investment

Nearly one hundred studies world wide have proven that agricultural research produces real and significant economic benefits. Several Canadian studies discussed in our report project annual rates of return from 15 to 65 percent. Up to 65 percent return each year for every dollar invested, compounded annually.

One of those studies, recently completed here at the University, (Alwin Ulrich, Hartly Furtan and Keith Downey) examined the returns from rapeseed research that took place from 1951 to 1984. The calculated annual rate of return was 51 percent. Starting from a lubricating oil for marine engines, Canadians developed an edible oil with as yet untapped potential. Canola now generates one-half billion dollars per year in export earnings, and nearly three-quarters of a billion dollars per year in farm cash receipts.

Let me give you another example a little closer to home that helps to put the size of these returns in perspective. We coordinated a three year New Crop Development Fund project with the Crop Development Center here looking at production systems for lentils. Al Slinkard and Brian Drew ran the project and some of you may have participated as cooperating producers. At the start of the project the area devoted to lentils on the prairies was declining. There had been a brief surge in production in the early 1970's, but farmers had experienced problems with growing the crop and most were abandoning it. By 1976 the area in lentils had declined to 320 hectares from a peak of 2 000 hectares in 1972. The

N.C.D.F. project, which ran from 1977 to 1979, cost a total of $100,545, with $55,480 coming from industry, and $45,065 from the N.C.D.F. By 1980, largely because of the success of this project, lentils were being produced on 44 400 hectares. Since 1981 the area in lentils on the prairies has averaged 61 000 hectares per year, and cash receipts have averaged about $27 million per year. Annual revenues of $27 million per year from an original investment of $100,000.

3. Financial Support for Research

We've seen that agriculture generates billions of dollars of economic activity. The Federal government also spends billions on the agri-food industry. In 1982/83, Federal expenditures on agriculture amounted to 2-1/4 billion dollars.

Surely, with these kinds of resources, agricultural research should be well supported. A close examination of Federal expenditures, though, reveals a different story.

First, the majority of Federal funds allocated to agriculture are not even controlled by Agriculture Canada. Of the $2.3 billion spent on agriculture in 1982/83, only $1.0 billion, or less than half, was allocated by Agriculture Canada (Table 2). Transport Canada, External Affairs, and Industry and Commerce together allocated $1.1 billion, largely for technical and food aid programs, and transport subsidies.

Second, when you examine the nature of government expenditures on agriculture, you find that research comprises only a small proportion of the total (Table 3). In 1982/83, storage and transportation assistance (e.g. Crow subsidy) amounted to $649 million; direct payments on commodity programs (e.g. stabilization payments) amounted to $436 million; technical and food aid programs amounted to $307 million; inspection and control services amounted to $218 million. Expenditures for research amounted to $171 million, or about 7.5 percent of the total.

TABLE 2

FEDERAL AGRI-FOOD EXPENDITURES BY DEPARTMENT

1970-71 to 1982-83 ($'000)

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
External Affairs	107,127	82,792	101,298	77,276	117,711	236,253	253,587	261,609	224,164	223,369	210,532	256,056	306,221
Indian & Northern Affairs	862	1,076	1,169	857	1,833	2,285	2,615	2,240	3,838	5,186	3,355	5,983	6,383
Agriculture Canada	277,006	286,095	312,857	426,420	664,281	651,092	630,259	958,580	767,963	781,870	881,531	1,124,603	1,010,244
Supply & Services	2,220	3,400	2,600	2,600	2,800	3,400	6,000	4,800	5,600	5,000	5,600	8,800	7,900
Employment & Immigration	151	153	250	240	2,034	3,462	3,924	17,473	19,804	28,910	38,705	37,591	42,644
Energy Mines & Resources	0	0	0	0	0	0	0	0	0	814	1,446	2,140	2,112
Environment	0	0	582	927	1,339	1,000	826	1,500	585	479	700	479	625
Regional Economic Expansion	49,821	51,081	64,019	68,125	83,559	91,183	91,561	106,473	111,866	99,344	153,602	101,836	81,280
Finance	0	0	0	0	0	0	0	0	0	0	0	0	0
Industry-Commerce	56,719	105,063	142,877	87,984	106,521	250,096	318,426	111,786	131,953	138,899	151,265	140,209	150,456
Health & Welfare	1,834	2,214	3,239	6,606	9,093	11,002	13,520	13,930	14,227	15,621	25,929	22,936	26,527
Science & Technology	3,557	4,004	4,807	5,787	6,580	8,258	9,741	11,271	12,851	16,900	19,903	22,793	26,237
Transport	30,992	41,969	35,068	51,122	89,222	105,650	107,227	178,722	239,947	269,539	341,402	364,278	622,371
Labour	0	0	0	0	0	0	0	0	21	16	0	0	0
TOTAL	530,269	577,847	668,766	727,944	1,085,047	1,363,681	1,437,686	1,668,384	1,532,819	1,585,947	1,833,970	2,087,704	2,283,000

Source: M. Rodier (1985). "Federal Government Expenditures in the Agri-Food Industry 1970-71 to 1982-83". Canadian Farm Economics, Vol. 19 (1). Pp. 33-45

TABLE 3

TOTAL FEDERAL AGRI-FOOD EXPENDITURES BY PROGRAMS AND ACTIVITIES

1970-71 to 1982-83 ($'000)

List of Programs & Activities	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
Direct Payments Through Commodity Programs	128,172	122,505	182,758	270,644	469,806	505,406	430,998	622,656	418,707	407,264	466,975	617,009	436,195
Social & Labour Programs	1,715	1,739	1,860	1,887	3,675	5,180	5,773	20,058	23,133	34,013	43,074	41,082	46,431
Crop Insurance	3,818	4,035	5,214	16,655	31,236	48,276	56,457	72,812	74,965	78,097	100,132	115,850	142,191
Financial Assistance	38,575	23,629	25,612	10,482	8,698	4,529	4,992	5,430	6,414	8,814	60,758	23,230	23,322
Storage & Freight Assistance	77,939	152,280	130,071	84,969	124,969	181,097	302,615	228,790	288,660	323,954	381,149	404,412	648,799
Research Programs	33,474	36,243	39,889	44,680	50,424	58,765	64,859	74,227	81,380	89,773	106,698	136,757	171,314
Information & Statistical Programs	4,430	6,307	5,978	5,984	6,832	12,918	16,482	16,016	11,605	11,828	18,272	14,877	14,203
Inspection & Control Services	40,527	47,549	54,861	63,594	77,710	97,002	110,169	118,841	150,783	150,658	170,156	171,031	217,746
Technical & Food Trade Programs	107,127	82,792	101,298	77,276	117,711	236,253	253,587	261,609	224,164	223,283	210,414	256,801	306,729
Marketing & Trade Programs	13,565	18,147	21,447	28,710	37,862	34,990	39,428	43,323	33,922	38,822	41,701	38,366	30,618
Regional & Industrial Economic Development	51,801	53,255	66,954	76,707	95,492	102,026	102,498	114,783	118,663	106,376	116,584	114,022	118,257
Administration (AG)	29,126	29,366	32,824	46,356	60,632	77,239	76,828	89,839	100,423	113,065	118,057	154,267	131,995
GRAND TOTAL	530,269	577,847	668,766	727,944	1,085,047	1,363,681	1,437,686	1,668,384	1,532,819	1,586,500	1,833,970	2,087,704	2,283,000

Source: M. Rodier (1985). "Federal Government Expenditures in the Agri-Food Industry 1970-71 to 1982-83". Canadian Farm Economics, Vol. 19 (1). Pp. 33-45

Third, due to other funding priorities, and fiscal restraint during a highly inflationary period, the real value of the funds devoted to agricultural research has been seriously eroded (Table 4). The real value of operating expenditures declined drastically, nearly 30 percent, from 1973/74 to 1980/81. Large increases were made in 1981/82 and 1982/83, but even with these increases the real value of operating funds in 1984/85 was less than in 1971/72.

Of equal concern has been the value of capital expenditures. The real value of these expenditures declined by nearly 60 percent from 1972/73 to 1980/81. Since then we've had to inject large sums to compensate for a decade of neglect.

In other words, today we're playing catch-up on the past. The physical plant has deteriorated, and operating budgets starved.

The reason for this situation arises from three factors. First, many big-ticket expenditure items have a statutory basis. Funding often cannot be reduced without the government going to Parliament. Second, agricultural research has a low political profile, and is therefore vulnerable to budget restraint. Finally, the results of cuts to research budgets don't manifest themselves for years. Thus the political fallout from these cuts can be delayed for years. In fact, the impact of a decreased research capability is so insidious that the true results may never be associated with the funding cuts.

I mentioned a few minutes ago that we're suggesting that the current level of research funding is not sufficient to maintain our competitiveness in world markets. There is strong evidence to support this conclusion. A study by George Brinkman at the University of Guelph in 1984 identified agricultural research and supporting services as one of the most important causes of productivity growth in agriculture. He concluded that the lack of funding for agricultural research in the 1970's was one of the most important reasons for the slowdown in the growth in agricultural productivity in that decade.

TABLE 4

AGRICULTURE CANADA FUNDING OF AGRICULTURAL RESEARCH AND DEVELOPMENT

	Current Dollars				Constant 1971 Dollars[1]			
	Operating	Capital	Grants and Contributions	Total	Operating	Capital	Grants and Contributions	Total
1985/86[E]	172,962,000	73,147,000	33,107,000	279,216,000	n/a	n/a	n/a	n/a
1984/85[E]	164,055,000	54,746,000	23,302,000	242,103,000	43,562,135	14,536,909	6,187,467	64,286,511
1983/84	155,739,000	25,716,000	37,405,000	218,860,000	43,224,813	7,137,386	10,381,626	60,743,825
1982/83	143,681,000	10,825,000	11,727,000	166,233,000	42,673,300	3,215,028	3,482,922	49,371,250
1981/82	114,763,000	6,835,000	15,686,000	137,279,000	37,664,260	2,243,190	5,148,014	45,055,464
1980/81	88,815,000	2,309,000	32,199,000	123,323,000	33,115,213	860,925	12,005,593	45,981,731
1979/80	80,404,000	2,509,000	22,050,000	104,963,000	34,055,061	1,062,685	9,339,263	44,457,010
1978/79	75,401,000	2,883,000	19,122,000	97,406,000	35,037,639	1,339,684	8,885,688	45,263,011
1977/78	84,021,000	2,463,000	4,760,000	91,244,000	42,306,647	1,240,181	2,396,777	45,943,605
1976/77	74,716,000	1,910,000	2,387,000	79,013,000	41,052,747	1,049,451	1,311,538	43,413,736
1975/76	67,502,000	2,037,000	2,203,000	71,742,000	42,109,794	1,270,742	1,374,298	44,754,834
1974/75	64,103,000	1,915,000	925,000	66,943,000	45,787,857	1,367,857	660,714	47,816,428
1973/74	55,919,000	2,015,000	1,036,000	58,970,000	46,872,590	1,689,019	868,399	49,430,008
1972/73	49,081,000	2,315,000	1,006,000	52,402,000	44,822,831	2,114,155	918,721	47,855,707
1971/72	45,136,000	1,866,000	903,000	47,905,000	44,337,917	1,833,006	887,033	47,057,956

E: estimate

[1] Deflated using the Implicit Price Index of Government Current Expenditure on Goods and Services (1971=100); Statistics Canada, National Income and Expenditure Accounts, Catalogue 13-001

Source: Dept. of Finance (1971/72-1983/84). Federal Public Accounts, Vol. 2. Section 1.
Agriculture Canada (1983, 1985). 1984-85 Estimates; 1985-86 Estimates.

If all our competitors had the same attitude to research and development as we have, this wouldn't be a problem. At the international level, though, Canada's overall research and development performance has seriously lagged that of our major competitors.

4. Requirements for Qualified Manpower

Today we face the predicament that even if funds for research are increased, we may not be able to recover lost ground quickly due to shortages of qualified personnel.

A recent study by the Natural Sciences and Engineering Research Council concluded that while there will be a sufficient number of MSc graduates to meet anticipated demand in the agricultural and biological sciences by 1990, there will be a shortage of PhD graduates. When broken down by area of specialization, more acute shortages are foreseen. Biotechnology is one key area that will be subject to shortages of qualified manpower. The number of graduating plant breeders will not be sufficient to meet expected demand. In veterinary medicine there is a lack of modern teaching and research facilities. Toxicology could become one of the most important research areas in the future due to rising public concerns over the effect of chemicals and pollutants on humans and the environment. Yet again, the number of toxicologists graduating in Canada will not meet anticipated demand.

We saw earlier that in the last few years there has been some increase in the level of funding for agricultural research at the Federal level. Unfortunately, there has been a significant downward trend in the number of personnel engaged in research and development in the natural sciences by Agriculture Canada since 1975/76 (Table 5). In 1984/85, the number of personnel was the lowest it's been since figures first became available in 1976.

TABLE 5

PERSONNEL ENGAGED IN RESEARCH AND DEVELOPMENT IN THE NATURAL SCIENCES BY AGRICULTURE CANADA

Year	Number of Personnel
1984/85	3712
1983/84	3860
1982/83	3916
1981/82	3887
1980/81	3788
1979/80	3811
1978/79	3864
1977/78	3868
1976/77	3901
1975/76	3994

Source: Statistics Canada (1985). "Federal Government Personnel Engaged in Scientific Activities". Science Statistics. Catalogue 88-001.

You may have seen the article entitled Researchers Clutch Their Budgets, Hope for the Best in the Western Producer two weeks ago. It reported that in the last seven years, prairie research stations lost 35 full-time positions and 19 casual or seasonal positions. Another 40 vacant positions have been put on hold. The research branch has been able to compensate for some of these losses through mechanization and computerization.

A further disconcerting factor is the fact that among the industrialized nations, Canada ranks a poor seventh in the number of research and development scientists and engineers per million people. The U.S. had over twice as many as Canada in 1984, and Japan over three times as many. Only Italy fared poorer.

Again, this has ramifications for our competitiveness.

In the United States there has been a recent drop in the number of people entering undergraduate agriculture programs, and this trend is starting to show up in some Canadian facilities of agriculture. The drop in the U.S. is being attributed to the poor image of agriculture, and the public's lack of awareness of the potential that exists within the industry. I think the same could be said for Canada.

In short, we have vacancies in our research establishment that aren't being filled. There are not enough students in the pipeline to meet future needs. And there are signs that the number of students entering the pipeline is declining.

5. Revamping the Research Planning and Priority Setting Mechanisms

Given the current state of our research establishment, it is essential that our planning and priority setting processes be as effective as is possible.

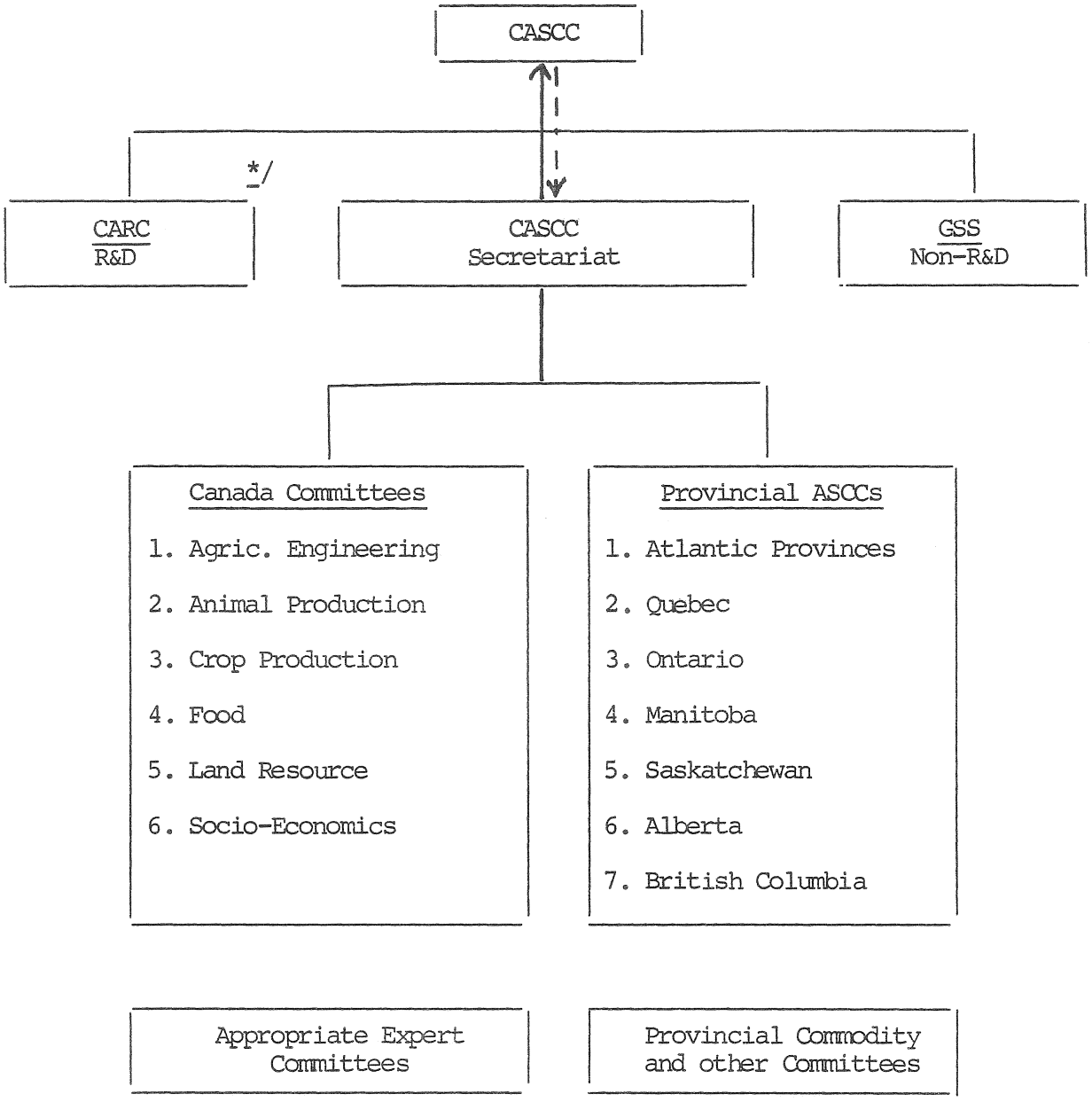
In Canada we've developed a comprehensive structure known as the CASCC system for this purpose (Figure 1). CASCC stands for the Canadian Agricultural Services Coordinating Committee. I am not going to describe the CASCC system in detail. Essentially it is a process by which government and university researchers, and some industry personnel, come together in a series of discipline oriented and regionally oriented committees to discuss research recommendations and some priorities. There are 6 major discipline oriented Canada Committees, and 31 associated Expert Committees. In addition there are seven regional services coordinating committees. All of these committees have sub-committees which are commodity specific. It is estimated that there are over a thousand individuals involved in this process.

Many in the industry feel that this system is cumbersome and somewhat isolated from the mainstream of research funding allocations. In an address to the Semi-Annual meeting of the Canada Grains Council last October, Walter Bushuk, former chairman of the Canada Committee on Crop Production Services, estimated that only about 5 percent of the total Canadian agricultural research budget comes under the scrutiny of CASCC. Most of the Agriculture Canada research budget, and essentially all university, provincial and industrial research budgets are not reviewed under this mechanism.

This is not to say that research planning and priority setting is ineffective. Most researchers in the system are diligent in assessing the needs of the industry and structuring their activities accordingly. The problem with the process as seen by the Council is twofold.

First, there is very little formal industry input into the process, and almost no producer input. Second, the process has almost no public exposure. Thus it is difficult to muster broad industry and public support for the needs of the research establishment.

FIGURE 1. Organizational Chart of the CASCC System



*/ LEGEND: Broken lines indicate return of recommendations to CASCC Secretariat after suggestions for disposition has been made by both CARC and GSS, and final decision taken by CASCC.

Preparing for the Future

Canadian and world agriculture is entering a period of unprecedented technological development, the ramifications of which are just starting to be appreciated. Also, the world marketplace for agricultural products will be substantially affected by political forces, particularly with respect to the priorities accorded to agricultural development in various regions. The recent emergence of the European Economic Community as an agricultural giant, and the tremendous strides made by China with regard to agricultural self-sufficiency, are prime examples of this phenomenon.

If agriculture is to continue to serve as an engine of economic growth in Canada, it will have to be superbly positioned to compete in this environment. We will not be able to buy our way through subsidization, and our comparative advantages in natural resources are few. Our success can only come through human excellence: entrepreneurial talent supported by an unsurpassed research and development capability.

It is imperative that the federal government take the initiative and expand its commitment to agricultural research. Research funds represent an unsurpassed investment opportunity for the government, the benefits of which far exceed those attainable in almost any other type of endeavour. Investment in agricultural research has to represent one of the most cost effective ways that exist for promoting sound economic development. This should surely be a consideration in this period of financial constraint.

The low priority which is now being accorded to agricultural research funding threatens to do immeasurable harm: Canada is in jeopardy of breaking the research continuum which is vital to technological development. The cost to any country which begins to lag behind in technological and entrepreneurial development will be enormous. This cost will be extracted either from the opportunities for economic growth which are foregone, or from the massive amounts of resources which will have to be redirected to recover ground lost to competitors.

Private industry can be challenged to increase its commitment to agricultural research in response to a federal government initiative. With such an initiative there is a concern that an increased commitment by the private sector will result in a reduced commitment by the federal government. This concern has been expressed time and time again by almost every responsible organization in the industry.

The current situation in Canada is critical. A decade of no real growth in research investment, coupled with a continued lack of a sense of urgency regarding the need for an enhanced research capability, must be rectified immediately. Four objectives are of paramount importance in this regard:

1. Canada's system for setting and coordinating research priorities must be improved.

2. The strategic priorities for Canada's research establishment must be reevaluated and more clearly defined.

3. There must be a significant infusion of resources into the agricultural research establishment at all levels of the industry.

4. Provision must be made to ensure that human resources are adequate to meet the requirements of this expanded establishment.

To attain these four objectives the Council recommends that:

1. An overall research development strategy for Canadian agriculture be determined by a two stage process. The objective of this process would be to explicitly detail the priorities for agricultural research and development, and the strategy to be pursued to achieve these objectives.

The first stage in the process would be for the Canadian Agricultural Research Council to prepare and distribute a document proposing short, medium and long term objectives, and a tentative strategy to achieve these objectives.

The second stage would be to discuss this document in depth at a National Research Priority Setting Conference convened by CARC in 1986. All parts of Canada's agricultural and food industry would be invited to participate in the Conference, as well as all members of CASCC. The Conference would be structured such that overall priorities, as well as priorities by sector and discipline, could be assessed. The main objective of the Conference would be to ensure that the strategy developed is appropriate to the current state and direction of industry affairs. A high level of industry input would be obtained, and the process would ensure broad exposure of the priorities and strategy throughout the industry and research community.

2. The National Research Priority Setting Conference convened under the auspices of the Canadian Agricultural Research Council be a pattern for the future and be repeated every five years. The U.S. Conference on Priorities for the Agricultural Research, Extension, and Higher Education held under the auspices of the Science and Education Administration of the U.S.D.A. in 1980 has shown this procedure is effective.

3. The structure of CARC and CASCC be modified in order to enhance representation from the business and farm sectors.

3(a) CARC Structure

Rather than having two appointed agribusiness and two farm representatives on CARC, eight membership positions be created to be filled by industry appointees. Three of these positions would be reserved for a representative of each of the three national sectoral councils: the Canada Grains Council, the Canadian Horticultural Council, and the Canadian

Meat Council. The remaining five positions would be reserved for a representative from the Maritime Farmers' Council, L'Union des Producteurs Agricole, the Ontario Federation of Agriculture, the Western Grain Research Foundation, and the Canadian Seed Growers Association.

3(b) CASCC Structure

Three additional membership positions be created for the chairmen of each of the three sectoral councils, the Canada Grains Council, the Canadian Horticultural Council, and the Canadian Meat Council. Two further positions should be reserved for the President of the Canadian Federation of Agriculture, and the Chairman of the Western Grain Research Foundation.

4. At the national level, the federal government should immediately commit itself to increasing funds for agricultural research by $50 million per year for the next five years, as well as expanding manpower by the equivalent of 50 to 60 professional person years per year. A $50 million per year additional commitment to research would represent less than 3 percent of Agriculture Canada's annual budget.

5. A share of the additional funds directed to research be administered in programs requiring private sector participation. The New Crop Development Fund has been very successful in this regard, and is the type of mechanism envisaged by this recommendation.

6. The government investigate innovative means by which funds can be obtained from industry for the support of research. The mechanism by which funds for the support of canola research have been acquired has proven very effective, and could serve as a useful model for other commodities.

7. In conjunction with a firm commitment to an increased public research effort, the federal government create a more favourable environment for private sector research. An immediate commitment to plant breeder's rights, and adequate patent protection for biotechnological developments would have a significant impact in this regard. In a similar vein, the government should give priority to establishing an effective system by which royalties can be collected on public research findings or products turned over to private sector companies for commercialization. The system should ensure that these royalties are directed back into research and development and do not simply become a component of general government revenues.

The Council is not a lobby organization, although I'm sure you realize that we're promoting a specific position with our report. At our Annual meeting last April the decision was taken that on this issue the Council would undertake to lobby the Federal government concerning the case for agricultural research. We will be working in concert with Agriculture Canada to try and raise the profile of research within the government, and within the Finance Department and Treasury Board. A meeting of the Council executive and Ministers Wise and Mayer is now being set up to discuss ways for the Council to proceed. We are hoping for audiences with the Commons and Senate standing committees on agriculture, as well as senior officials and ministers of the Finance Department and Treasury Board.